Symons's
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THE METEOROLOGICAL OFFICE.

We have received the following intimation from Sir Napier Shaw, under date of May 23rd, 1918 :—

The Lords Commissioners of His Majesty's Treasury have been pleased to approve the proposal of the Meteorological Committee that in view of the variety and importance of the scientific problems upon which the Meteorological Office is required to advise the fighting forces, Sir Napier Shaw, F.R.S., shall, for the period of the war, become scientific adviser to his Majesty's Government in Meteorology, being relieved of the administrative duties of the Meterorological Office but retaining the Chairmanship of the Meteorological Committee, Lieut.-Col. H. G. Lyons, R.E., F.R.S., with the sanction of the War Office, being appointed Acting Director of the Meteorological Office for the same period.

ROYAL METEOROLOGICAL SOCIETY.

A meeting of the Society was held on Wednesday, May 15th, at 70, Victoria Street, S.W., Sir Napier Shaw, F.R.S., President, in the Chair.

Mr. C. E. P. Brooks, M.Sc. read a paper, entitled : "Continentality and Temperature, Second Paper." The first part dealt with the variation with latitude of the coefficients which give the influence of land on temperature, land east, land west and ice being considered separately, and it was found that in the tropics the coefficients are uniformly small. In the temperate regions in winter the effect of land to the east is also small, but land to the west has a well-marked effect in lowering temperature ; this effect increases towards the poles. In summer land both east and west increases temperature. In the second part the temperatures of land and water hemispheres were calculated. The distribution of land and sea at the beginning of the Great Ice Age was reconstructed from geological data, and on applying the calculated formulae to this changed distribution it was found that the temperature must have been lower than the present in different districts by various

amounts up to 20°C. in January and 15°C. in July. These changes agreed very closely with those required by geologists and palæontologists, and it was further proved that the glacial period was a necessary consequence of the geographical changes. Finally a theory of climatic evolution was outlined in accordance with these ideas, and the theory of isostasy.

The report on Phenological Observations in the British Isles during 1917 was presented by Mr. J. Edmund Clark and Mr. H. B. Adames. The persistent winter, hardly broken over four and a half months from early December, dominated seasonal conditions. The temperature from December to April showed in England, S.W., a deficiency of 4°·8 F., ranging to 1°·2 in Scotland, N. In the southern half of our islands the 125 days to mid-April were cold almost beyond precedent in the previous hundred years, farm and garden prospects being therefore of the gloomiest. By the end of spring there was a complete change. Absence of keen winds and frosts favoured the belated blossoming, and by June flowering dates were normal, although the early spring flowers, anemone and blackthorn, had been twenty and twenty-four days late. From the time of the dog rose, dates were actually early. Finally, the chief practical result of the cold was indirect, the heavy destruction of bird life favouring tree blight and caterpillars, the ova of which had been preserved by the cold. In many parts caterpillars stripped fruit trees and ruined garden greens. The antler caterpillar plague in Derbyshire was ascribed mainly to the scarcity of rooks. On the other hand berries and other fruits suffered little from birds. From late July into September the splendid harvest prospects were much marred by rain, wind and lack of sun. Final results were better than in 1916, although grain crops fell about 5 per cent below the ten-year average in England. As to roots, a warm, dry November more than made up for the cold, wet October, and potatoes gave a record crop with 8,600,000 tons off 1,364,000 acres, compared with 5,468,000 off 1,134,400 in 1916. Tree fruits were excellent, the August gales proving prejudicial to apples only. November gave a splendid send-off for the coming year in the exceptionally favoured winter earring of the grain crops. Table V. of the Report gave the yearly floral means for the five chief districts from 1891. That year alone was later than 1917, namely, 9·6 days against 7·6, after the mean flowering date, May 17·4. Birds and insects, in Table VI., confirmed the lateness of 1917, averaging 6 and 12 days behind, whilst Table VII., of 24 migrants, showed nearly 10 days lag behind a 20-year mean, 1877-1896.

The following candidates were balloted for and elected Fellows of the Society :—Sir J. Benton, K.C.I.E., Mr. J. Fairgrieve, M.A. Capt. E. H. D. Nicholls, Director of Public Works, Cyprus, Mr. W. Norbury, and Ensigns J. D. Anderson, A. B. Leonard and W. P. Prien, of the U.S. Naval Reserve Force.

INVERSE WEATHER PHENOMENA.

(Concluded.)

By L. C. W. BONACINA.

There is one more feature to be discussed in this article, namely, the true inverse of snowstorms. It was demonstrated at the beginning that the seasonal antithesis between snowstorms and thunderstoms is less complete than between gales and thunderstorms inasmuch as the highest monthly snowfall frequencies overlap into the thunder season in April and fall short of the commencement of the common gale and fog season in October; and when the physical processes involved are examined, one finds in accordance with the seasonal hint, a correspondingly weaker case of inversion.

But, remembering that the snow season embraces both the winter solstice, November to February, and the spring equinox, March and April, if one looks at the opposite period of the summer solstice, May to August, and the autumnal equinox, September and October, taken together, can any feature of the rainfall of the warmer months be discovered which, on the basis of determining conditions, can be regarded as an inverse weather phenomenon to snowfall? Now precipitation in the colder months is, so far as the temperature effect is concerned, less intense than in the warmer months, and this is the reason why individual summer downpours tend *cæteris paribus* to be heavier than winter rainfalls and, *a fortiori*, snowfalls. In fact as a simple temperature effect it would be true to regard the heavy character of showers and rainstorms in summer and autumn as the inverse climatic feature of snow showers or storms in winter and spring. In this case it is merely the striking physical appearance of the frozen form of precipitation in a land where the liquid form is more prevalent that renders the winter one of the inversely related pair the more conspicuous; but *heavy* rain is as much characteristic of the warmer months of the year as snow is of the colder.

In this connection it is important to guard against a rather prevalent error among meteorologists of confusing heavy summer rainstorms as such with thunderstorms. Probably not more than a quarter of the number of heavy summer downpours are occasioned by thunderstorms in the real sense, and not more than half could be called thunderstorms in even a secondary sense. The true thunder or electrical disturbance is a highly distinctive phenomenon; but many of the heavy rainstorms of summer in association with the passage of small cyclonic depressions are not accompanied by thunder and lightning at all. The great Norwich rainstorm at the end of August, 1912, was in no sense a thunderstorm, and the great rainstorm of the night of June 28th, 1917, was not in a primary sense a thunderstorm, the electrical disturbance being but feeble

and occasional. But the great London rainfall of June 16th, 1917, on the contrary, was brought by a thunderstorm in the fullest sense of the term. The importance of distinguishing between summer thunderstorms and rainstorms in regard to the inverse phenomena under discussion is this : thunderstorms are, as has been pointed out, mainly solstitial phenomena (May to August), but showers or rains of a high degree of intensity but without electrical disturbance continue to characterize the period of the autumnal equinox, September and October. The reason is that heavy rain, which indicates high absolute humidity is simply favoured by the high air temperature which exists in autumn in consequence of the atmosphere's accumulated store of warmth ; but thunderstorms, on the other hand, require for their full violence not only a high air temperature but also the direct heating effects of powerful radiation, and this combination can only be had during the solstitial or midsummer period. The contrast in this respect between the month of May with its violent electrical storms generated by the shaft-like force of the sun's rays, and the month of September, with its heavy rain showers, but fewer and less powerful electrical disturbances, is a feature that can hardly fail to have struck the majority of climatic observers. In July thunderstorms and simple rainstorms are both very prominent ; but the super-imposition of the thunderstorms on the more general rainfalls, which are more common than in the drier month of May, seems *ipso facto* to have the effect of often rendering the thunderstorms of the later or hotter part of the season less severe on the *electrical* side than those which mark the earlier and cooler part when thunderstorms are bred with special facility by the first heat of the year.

REVIEW.

Twelfth Annual Report of the Meteorological Committee. For the Year ended March 31st, 1917 (62nd year of the Meteorological Office). Published by H.M. Stationery Office, 1917. Size, 9½ × 6. Pp., 16. Price, 1d.

The twelfth Annual Report of the Meteorological Committee has dwindled to a mere shadow of its predecessors, but bears evidence that the work of the Meteorological Office has increased in an inverse ratio. One of the new activities mentioned consists in the taking over of the responsibility for the Committee on the Investigation of Atmospheric Pollution. A large number of the regular staff of the Office are absent on war duties, many of them being engaged in the Meteorological Section of the Royal Engineers under Major E. Gold, D.S.O. The Meteorological Office has also undertaken the training of a number of outside candidates for this service.

Correspondence.

To the Editor of Symons's Meteorological Magazine.

THE HEAT AND THUNDERSTORMS OF MAY.

THE month of May, 1918, was very true to type, the first half being cool, with an occasional suspicion of sultriness in the afternoons, and the second half full summer. The first advance of the summer in May is always an impressive phase of climate, and this year it took the form between the 15th and 22nd of an unbroken spell of sustained warmth during which the rich tones of the sky and the refulgence of the new foliage in the fierce solar rays were magnificent. As is invariably the case in early summer such conditions meant electrical disturbance, and in the London district violent thunderstorms occurred on the 17th and 22nd. The first indications of the evening storm of the 22nd were apparent on the 21st, and it often happens that heat thunderstorms take a couple of days to develop. Thus thundery-looking cumulus on the afternoon of the 21st died down at dusk, and it only wanted another day's heat for the storms to burst the following evening. In the Hampstead district considerable damage was done both on the 17th and 22nd, and on the latter occasion ball lighting is reported to have been seen. The ordinary flashes on the 22nd were of blinding intensity and were followed on more than one occasion by instantaneous crashes. There was rather more general wind motion during the storm of the 22nd than is usual in heat thunderstorms. The year 1918 serves to confirm my impression that the month of May is the most constant in character, and in some ways the best and most reliable of the summer months. How often does June fall back on May !

L. C. W. BONACINA.

Hampstead, June 4th, 1918.

A VIOLENT thunderstorm was experienced in this district on May 17th. Thunder was first heard about 1.30 p.m.; the storm broke at 3.30 and continued practically without interruption until 7 p.m. Two or three storms seemed to meet in this neighbourhood after working round and round for a considerable time. At one time there was lightning every five seconds and consequently there was a continuous uproar as if there were violent gunfire taking place in the sky. The rainfall may without exaggeration be described as terrific. The ground floors and basements of houses were flooded out, roads torn up and rendered impassable owing to rushing torrents of water. Serious damage was done to the allotments and crops in general. At Steppingley hailstones the size of marbles fell to the depth of three to four inches, unless my informant was exaggerating.

R. A. S. MACKENZIE.

The Hawthorns, Flitwick, Beds., May 25th, 1918.

THE heaviest thunderstorm since August, 1879, broke over this village and district this afternoon. Peals of thunder began about 2 p.m., but there was no rainfall worth mentioning till 4 p.m. Rain then came down in torrents, lightning very vivid and thunder claps deafening. About 4.30 there was much hail, the stones being very large, but this was not so noticeable at my end of the village as near the church; the deluge of rain and hail there must have been much heavier than where I live, as some two hours later the hail stones were lying by the road side several inches thick, and we had none to be seen. At 4.45 there was a slight abatement, but from 5 to 5.30 the rain came down in sheets and the thunder returned and was more terrific than ever. Rain continued till about 6.30. Total fall, 3·07 in., quite a record here, the nearest approach to it for a single storm being ·57 in. in 35 minutes, on July 19th, 1903.

So far as I can gather it was very local, as no rain fell beyond Woburn, two miles north-west, or beyond Harlington, four miles east, and it did not reach Dunstable, which is six miles south-east.

CHARLES J. KILBY.

Milton Bryan, Woburn, Beds., May 17th, 1918.

AN extraordinary hail storm occurred here soon after 3 p.m. on May 17th. The morning had been hot and sunny—maximum, 75°·1. Shortly before 3 p.m, it clouded over and a violent thunderstorm occurred accompanied first by hail, and then by rain. By 4 p,m. it was quite bright again. I have seen larger hailstones on the Himalayas, but never any approaching their size in Great Britain. The stones were literally the size of very large marbles. The hail only fell quite locally, the villages on either side not getting any. The rain measured ·39 in. My solar thermometer was smashed to pieces.

C. J. BROMHEAD.

Plâs Draw, Ruthin, North Wales, May 20th, 1918.

SNOW IN ALGIERS.

I HAVE received a letter from Algiers from Rev. E. Arkwright, whose villa is about 400 ft. above sea level, and three-quarters of a mile, as the crow flies, from the innermost part of the bay of Algiers. The position may be described as a little way up the back of an armchair that is set looking N.E., *i.e.*, with higher ground near by to S.E. and to N.W. and higher still immediately to S.W.

He writes of a snow such as in forty-five years there he never has known. Certainly in my thirteen years there, from 1875 to 1889, there was nothing like it. His letter, of December 28th, 1917, says:

> "Yesterday morning snow lay apparently 12 inches deep over everything, a most lovely soft covering, and on every twig was a load of three or four inches! Our rain is also a record. Since the summer, we have had 21·17 in. It was 17·77 in. in 1916, and 18·60 in. in 1915, and both seemed to beat the record. *P.S.*—29th.—Ice on the ponds."

In my time I saw snow flakes occasionally, and snow lying only once, about an inch deep. I do not think that I ever saw ice on water more than a few inches deep. My friend does not say in what months the rain fell. It is generally almost entirely in October, November and December, especially in December.

H. A. BOYS.

North Cadbury Rectory, Somerset, January 9th, 1918.

MOUNTAIN MISTS AND WATER SUPPLY.

In the Spanish forestry journal, *Amigos del Arbol*, for January, 1918, Dr. Perez, of Tenerife, discusses the precipitation of water from mountain mists by means of forests. He points out that the mist or cloud collected over Table Mountain, south of Cape Town, which is compared by travellers to a table cloth, forms more abundantly in the summer or rainless months when the south-east wind blows harder. He cites Dr. Marloth's experiments with two rain gauges, one representing the forest by having a series of rods rising from the funnel, the other an ordinary gauge, as described in the *Transactions of the South African Philosophical Society*, vols. 14 and 16. From December, 1902, to February, 1903, nearly 80 inches (2 metres) of water was collected in the rain gauge representing the forest and very little in the other.

In the Canary Islands the north-east Trade winds bring about the formation of a similar belt of clouds between, say, 2,000 and 5,000 feet altitude, where the evergreen forest of the Atlantic Islands grows best, and amongst them a laurel, called *Til*, which was undoubtedly the famous *Garoe* or *Holy Tree* of the Island of Ferro, which actually supplied that fountainless island with drinking water for the inhabitants until a storm blew it down. Anyone who has gone through a forest in the Canaries covered with mist can bear witness as to how much water is condensed by the foliage where trees grow. What creditable historians relate about the holy tree of Ferro is not a miracle but a scientific fact which has been proved at a similar altitude on Table Mountain, near Cape Town, under similar circumstances, and this fact should never be forgotten by those who undertake a campaign in favour of covering arid mountains by forests and thus utilizing the mountain mists in suitable localities.

We may add that the power of trees to cause the small spherules of mist to coalesce into rain-drops and drip in a steady stream to the ground is familiar to everyone who walks through an English wood during a winter mist. We have repeatedly noticed that on a misty day the road running through a forest is dry and even dusty, while the ground under the trees on either side is saturated with water, and the falling drops produce the familiar sound of a steady shower in still weather.

METEOROLOGICAL OBSERVATIONS AT LU-KIA-PANG, CHINA, FOR 1917.

By Rev. J. De Moidrey, S.J.

I.—*Barometric Pressure. Millibars.*

	8 a.m.	2 p.m.	8 p.m.	Daily Mean.
Jan.....	**1030·3**	**1028·1**	**1029·4**	**1029·4**
Feb.	24·7	22·8	23·9	23·9
Mar.	23·7	21·8	22·6	22·7
April ...	14·2	12·6	13·3	13·3
May.....	11·3	09·8	10·3	10·4
June	05·8	04·9	05·3	05·2
July	*05·4*	*04·4*	*04·6*	*04·7*
Aug.	05·8	04·5	05·3	05·1
Sept. ...	12·3	11·0	12·2	11·8
Oct.	19·2	17·1	18·5	18·2
Nov. ...	30·0	24·1	25·3	25·1
Dec.	26·7	24·6	25·8	25·7
Year	1017·1	1015·5	1016·4	1016·3

IV.—*Mean amount of Cloud.*

Jan.	*3·7*
Feb.	5·5
Mar.	5·9
April	7·4
May	5·9
June	**8·3**
July	7·8
Aug.	5·7
Sept.	6·6
Oct.	5·9
Nov.	5·3
Dec.	3·9
Year	6·0

V.—*Days with Thunder-storms.*

Jan.	—
Feb.	—
Mar.	—
April	—
May	1*a*
June	4
July	4
Aug.	6
Sept.	1*b*
Oct.	—
Nov.	—
Dec.	—
Year	16

a First, May 3. *b* Last, September 16.

II.—*Temperature. Degrees Centigrade.*

	MEAN DAILY.			MINIMUM.			
	Mean.	Lowest.	Highest.	Mean.	Hour A.M. h.	min.	Lowest.	Highest.
	°	°	°	°			°	°
Jan.	*—0·2*	*—6·8*	+4·2	*—4·1*	5	30	*—10·5*	+3·1
Feb.....	+3·4	—2·2	9·2	—0·8	4	45	—6·3	6·5
Mar.	7·1	+1·2	13·7	+2·8	4	35	—3·8	9·2
April	14·4	10·8	18·8	9·7	3	45	+5·7	12·9
May.....	18·7	11·4	25·6	13·3	4	5	8·6	18·8
June	23·9	18·1	31·2	20·8	3	50	15·7	26·8
July	**27·3**	21·8	**32·1**	**24·6**	4	50	19·3	**27·8**
Aug.	27·2	24·4	30·9	23·7	3	20	19·9	26·5
Sept. ...	23·9	19·1	29·2	21·0	4	5	19·1	26·0
Oct.	17·2	11·5	19·7	13·4	4	10	6·1	17·4
Nov.	9·5	4·6	15·1	5·7	5	5	0·6	13·7
Dec.....	2·3	—6·0	11·4	—1·0	4	50	—8·8	10·9
Year	14·6	—6·8*c*	32·1*d*	10·8	4	30	—10·5*c*	27·8*e*

Latest frost, March 24th (—0°·2); earliest, December 16th (—0°·8).

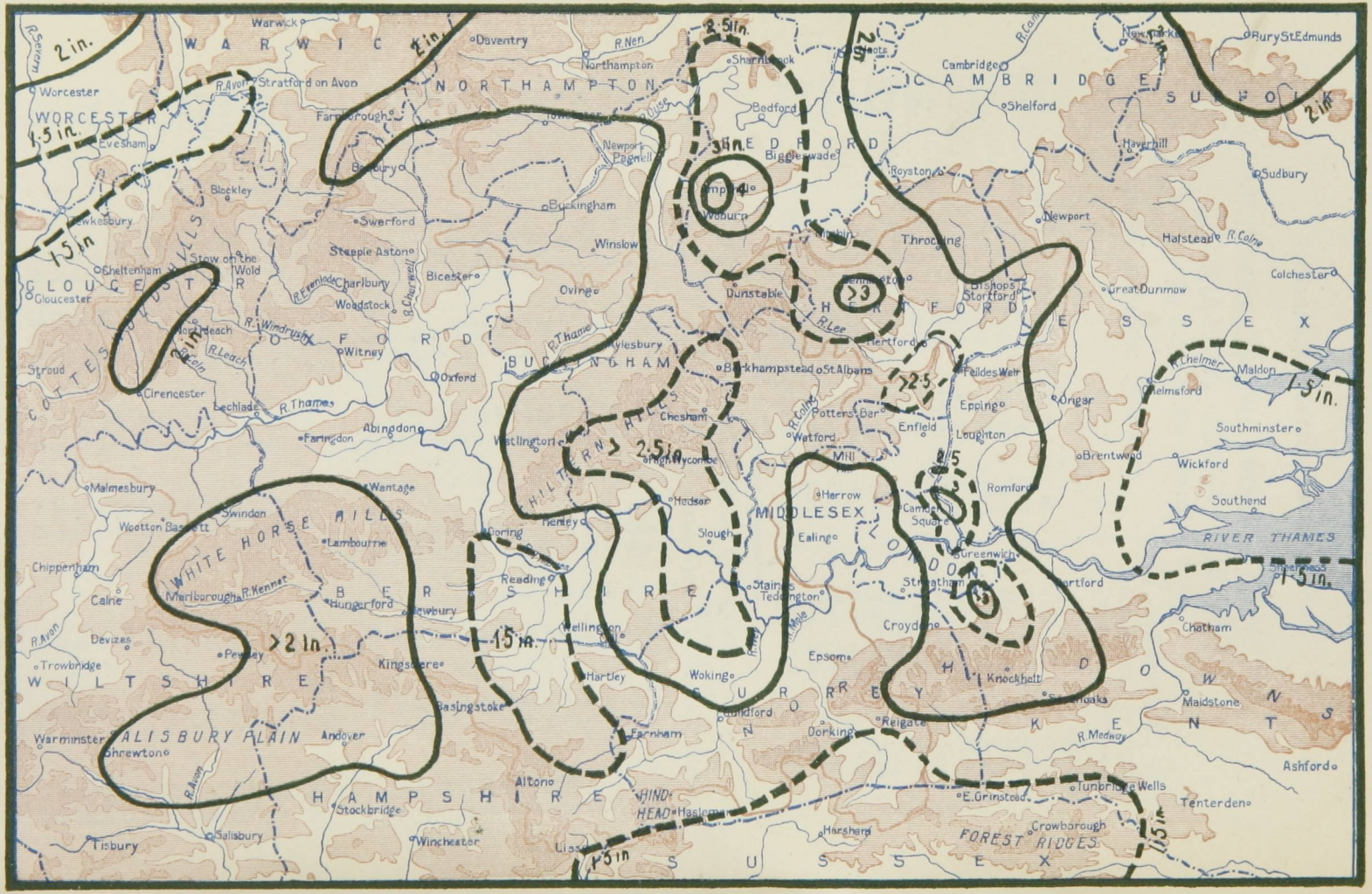
II.—(*con.*)

	MAXIMUM.				RANGE.		
	Mean.	Hour, P.M. h.	m.	Lowest.	Highest.	Mean.	Lowest	Highest.
	°			°	°	°	°	°
Jan.	*+4·9*	13	35	*—3·4*	+11·6	9·0	*1·6*	14·7
Feb.....	9·3	13	50	+1·1	19·8	10·1	2·6	19·1
Mar.	12·6	13	45	4·7	23·5	9·8	1·7	18·5
April	20·8	13	50	11·8	29·3	11·4	2·6	19·3
May.....	25·4	14	5	13·2	34·8	**12·2**	3·8	**20·0**
June ...	28·0	14	5	20·1	36,3	7·2	*1·6*	15·1
July.....	30·8	13	30	23·8	36·5	*6·3*	2·2	9·8
Aug.	**32·3**	13	50	26·8	**36·8**	8·6	2·6	11·3
Sept.	28·6	13	10	23·8	34·2	7·6	2·1	12·4
Oct.	22·9	12	50	15·2	26·8	9·4	2·5	15·2
Nov.	14·8	13	20	9·9	20·2	9·2	2·3	15·0
Dec.	6·9	13	10	—2·7	16·0	7·8	1·8	14·0
Year ...	19·8	13	35	—3·4*c*	36·8*f*	9·0	1·6*g*	20·0*h*

c Jan. 8. *d* July 3. *e* July 2. *f* Aug. 12. *g* Jan 1; July 15 *h* May 18

(*To be continued*).

THAMES VALLEY RAINFALL. MAY, 1918.



Symons's Meteorological Magazine.

Watershed of River Thames above Teddington, and River Lee above Feildes Weir.

Isohyetals

THE WEATHER OF MAY.

MAY opened in a most unseasonable mood. The country was, at the time, under the influence of a cold easterly wind, blowing in the front of a shallow cyclonic system which lay off our south-west coasts; and on the 1st there were few places in which the maximum thermometer touched 50°, and, in the north and east, several places in which it did not reach 45°. On the same night a sharp ground frost occurred in many northern districts, the exposed thermometer falling to 21°, at Blackpool, Aberdeen and Balmoral, and to 23°, at West Linton. Between the 2nd and 6th, the south-western disturbance extended very slowly over nearly the whole kingdom, and the weather became generally unsettled, thunderstorms occurring at some southern stations on the 3rd, and heavy rain in the north-east of Great Britain on the 5th and 6th. The cold easterly wind was, however, soon replaced by more variable breezes, and temperature rose to a fairly seasonable level, the maximum readings on the 4th being in many places quite 15° higher than those of the 1st. With the opening of the second week the conditions, though still changeable, assumed a more normal aspect. For the next few days the weather was influenced by Atlantic depressions which spread in from the westward or north-westward, causing winds from between S. and W., with temperatures differing but little from the average. Between the 9th and 11th, the thermometer rose above 65° in many districts, and touched 71° at Kilmarnock and Waterford.

After the middle of the month anticyclonic conditions were in the ascendant and the weather was, therefore, generally fine. There were, however, two important breaks, one on the 17th, the other on the night of the 22nd or on the 23rd. In each case thunderstorms were very prevalent, those of the latter dates finding their way to almost every corner of Great Britain. In some instances the storms were accompanied by exceedingly heavy falls of rain and hail; on the 17th nearly 3 inches of rain fell at Fulbeck, and on the 23rd nearly 3¼ inches at Beddgelert. Between the 20th and 22nd, temperature rose to an unusually high level for the time of year, readings of 80° and upwards being recorded in nearly all the English districts, and a reading of 84° at Manchester and Clifton (Bristol). Later on the wind, though light, was mainly from some easterly quarter, and the weather was, therefore, much cooler, but at the same time exceedingly fine and bright. In the south-west of England and the south of Ireland the duration of sunshine in the closing week (ended June 1st) amounted to more than 75 per cent., and at Valencia (Cahirciveen) to as much as 88 per cent., of the possible for the season.

The distribution of rainfall during the month was patchy, on account of local thunderstorms. These appear to have been most severe in the south-east Midlands of Englands and particularly in the neighbourhood of Woburn, where very severe flooding and hail occurred on the 17th. The effect of these storms on the rainfall map of the Thames Valley, facing this page, is well marked, and reference is made to their destructive effect in our correspondence pages. Apart from this most of the south of England had less than 2 inches of rain, and the north rather more than 2 inches. Scotland was slightly wetter, but with very moderate falls in the Western Highlands and there, as in Ireland also. the tendency was for the rainfall to be relatively greater in the east than the west. The general rainfall in the countries, expressed as a percentage of the average, was;—England and Wales, 113; Scotland, 94; Ireland, 91; British Isles, 100.

In London (Camden Square), the mean temperature was 57°·7, or 3°·7 above the average of 50 years. The duration of bright sunshine was 185·2 hours, and the duration of rainfall, 28·8 hours. Evaporation, 2·38 in.

RAINFALL TABLE FOR MAY, 1918.

STATION.	COUNTY.	RAINFALL.						
		Aver. 1875—1909. in.	1918. in.	Diff. from Av. in.	Per cent. of Av.	Max. in 24 hours. in.	Max. in 24 hours. Date.	No. of Days
Camden Square	*London*	1·75	2·11	+ ·36	121	·49	22	11
Tenterden	*Kent*	1·65	1·76	+ ·11	106	·41	5	12
Arundel (Patching)	*Sussex*	1·80	1·83	+ ·03	102	·71	4	9
Fordingbridge (Oaklands)	*Hampshire*	2·09	1·54	— ·55	74	·46	7	9
Oxford (Magdalen College)	*Oxfordshire*	1·81	1·77	— ·04	98	·36	12	9
Wellingborough (Swanspool)	*Northampn*	1·98	2·32	+ ·34	117	·53	3	10
Bury St. Edmunds (Westley)	*Suffolk*	1·93	2·51	+ ·58	130	1·43	23	10
Geldeston [Beccles]	*Norfolk*	1·78	·93	— ·85	52	·42	12	7
Polapit Tamar [Launceston]	*Devon*	2·08	·82	—1·26	40	·15	25	12
Rousdon [Lyme Regis]	,,	2·02	1·68	— ·34	83	·46	12	11
Stroud (Field Place)	*Gloucester*	2·10	1·72	— ·38	82	·50	17	10
Church Stretton (Wolstaston)	*Shropshire*	2·64	3·54	+ ·90	134	1·38	23	13
Boston	*Lincoln*	1·80	3·59	+1·79	200	1·43	17	9
Worksop (Hodsock Priory)	*Nottingham*	2·08	1·95	— ·13	95	·53	3	9
Mickleover Manor	*Derbyshire*	2·10	2·86	+ ·76	136	·93	23	10
Buxton	,,	3·30	...	...	...	...	...	...
Southport (Hesketh Park)	*Lancashire*	2·13	3·28	+1·15	154	1·07	22	13
Wetherby (Ribston Hall)	*York, W.R.*	2·09	3·92	+1·83	188	·87	21	8
Hull (Pearson Park)	,, *E.R.*	1·98	2·05	+ ·07	103	·45	11	10
Newcastle (Town Moor)	*North'land*	2·04	1·67	— ·37	82	·67	5	11
Borrowdale (Seathwaite)	*Cumberland*	7·50	...	...	...	...	...	...
Cardiff (Ely)	*Glamorgan*	2·56	1·43	—1·13	56	·44	7	14
Haverfordwest	*Pembroke*	2·62	1·62	—1·00	62	·34	12	8
Aberystwyth (Gogerddan)	*Cardigan*	2·63	5·03	+2·40	192	1·68	23	11
Llandudno	*Carnarvon*	1·86	3·70	+1·84	200	·74	23	10
Cargen [Dumfries]	*Kirkcudbrt.*	2·87	2·55	— ·32	89	·40	25	12
Marchmont House	*Berwick*	2·53	2·46	— ·07	97	·74	5	9
Girvan (Pinmore)	*Ayr*	2·98	2·52	— ·46	84	·94	22	17
Glasgow (Queen's Park)	*Renfrew*	2·40	2·15	— ·25	89	·40	5	16
Islay (Eallabus)	*Argyll*	2·58	2·44	— ·14	95	·47	14	16
Mull (Quinish)	,,	2·99	3·49	+ ·50	116	·67	14	20
Balquhidder (Stronvar)	*Perth*	4·10	2·96	—1·14	72	1·48	22	9
Dundee (Eastern Necropolis)	*Forfar*	2·05	3·58	+1·53	175	·85	4	16
Braemar	*Aberdeen*	2·33	2·87	+ ·54	123	·67	22	10
Aberdeen (Cranford)	,,	2·40	1·85	— ·55	77	·73	6	14
Gordon Castle	*Moray*	2·10	1·78	— ·32	85	·45	11	13
Drumnadrochit	*Inverness*	2·33	3·18	+ ·85	136	·94	25	17
Fort William	,,	3·93	3·22	— ·71	82	·66	14	18
Loch Torridon (Bendamph)	*Ross*	4·54	2·85	—1·69	63	·50	9	15
Dunrobin Castle	*Sutherland*	2·19	1·75	— ·44	80	·38	22	11
Glanmire (Lota Lodge)	*Cork*	2·54	2·45	— ·09	96	·82	2	11
Killarney (District Asylum)	*Kerry*	3·05	2·15	— ·90	70	·54	3	15
Waterford (Brook Lodge)	*Waterford*	2·33	2·65	+ ·32	114	·67	3	12
Nenagh (Castle Lough)	*Tipperary*	2·51	2·74	+ ·23	108	·68	3	12
Ennistymon House	*Clare*	2·70	2·06	— ·64	76	·45	6	13
Gorey (Courtown House)	*Wexford*	2·24	2·74	+ ·50	122	·66	23	14
Abbey Leix (Blandsfort)	*Queen's Co.*	2·43	2·60	+ ·17	107	·40	3	14
Dublin (Fitz William Square)	*Dublin*	2·07	2·27	+ ·20	110	·42	3	10
Mullingar (Belvedere)	*Westmeath*	2·51	1·93	— ·58	77	·50	3	11
Crossmolina (Enniscoe)	*Mayo*	3·17	2·58	— ·59	82	·44	3	20
Cong (The Glebe)	,,	2·94	2·18	— ·76	74	·53	14	16
Collooney (Markree Obsy.)	*Sligo*	2·80	2·06	— ·74	74	·39	20	16
Seaforde	*Down*	2·72	2·81	+ ·09	104	1·12	3	14
Ballymena (Harryville)	*Antrim*	2·84	2·17	— ·67	77	·33	3	18
Omagh (Edenfel)	*Tyrone*	2·66	2·52	— ·14	95	·60	22	15

SUPPLEMENTARY RAINFALL, MAY, 1918.

Div.	STATION.	Rain inches.	Div.	STATION.	Rain inches.
II.	Warlingham, Redvers Road..	2·21	XI.	Lligwy	2·94
,,	Ramsgate.....	1·73	,,	Douglas, Isle of Man	2·87
,,	Hailsham	1·77	XII.	Stoneykirk, Ardwell House...	3·55
,,	Totland Bay, Aston House...	1·33	,,	Carsphairn, Shiel.....	2·54
,,	Stockbridge, Ashley..	1·66	,,	Langholm, Drove Road	2·90
,,	Grayshott.....	1·59	XIII.	Selkirk, The Hangingshaw..	2·40
III.	Harrow Weald, Hill House...	1·86	,,	North Berwick Reservoir.....	2·10
,,	Pitsford, Sedgebrook.....	1·78	,,	Edinburgh, Royal Observaty.	2·93
,,	Woburn, Milton Bryant.....	4·83	XIV.	Biggar.....	1·86
,,	Chatteris, The Priory.....	1·73	,,	Maybole, Knockdon Farm ...	2·44
IV.	Elsenham, Gaunts End	2·05	XV.	Buchlyvie, The Manse.....	2·74
,,	Shoeburyness	1·35	,,	Ardgour House	4·30
,,	Colchester, Hill Ho., Lexden	1·74	,,	Oban.....	2·99
,,	Ipswich, Rookwood,Copdock	1·66	,,	Campbeltown, Witchburn ..	4·25
,,	Aylsham, Rippon Hall.... ..	1·13	,,	Holy Loch, Ardnadam.....	4·86
,,	Swaffham	2·93	,,	Tiree, Cornaigmore	...
V.	Bishops Cannings	2·02	XVI.	Glenquey	3·30
,,	Weymouth.....	1·83	,,	Loch Rannoch Wall.....	3·71
,,	Ashburton, Druid House.. ...	1·26	,,	Blair Atholl	3·84
,,	Cullompton	1·43	,,	Coupar Angus	3·08
,,	Lynmouth, Rock House	1·27	,,	Montrose, Sunnyside Asylum.	3·33
,,	Okehampton, Oaklands.....	1·49	XVII.	Balmoral	2·11
,,	Hartland Abbey.....	1·29	,,	Fyvie Castle	1·90
,,	St. Austell, Trevarna	1·11	,,	Keith Station	1·75
,,	North Cadbury Rectory.....	1·87	XVIII.	Rothiemurchus	2·19
VI.	Clifton, Stoke Bishop	2·08	,,	Loch Quoich, Loan	4·06
,,	Ledbury, Underdown..... ...	1·55	,,	Skye, Dunvegan	3·21
,,	Shifnal, Hatton Grange.....	3·76	,,	Fortrose.....	2·90
,,	Droitwich.....	2·31	,,	Glencarron Lodge	2·11
,,	Blockley, Upton Wold.....	1·86	XIX.	Tongue Manse	1·75
VII.	Grantham, Saltersford.....	1·42	,,	Melvich	1·43
,,	Market Rasen	...	,,	Loch More, Achfary	1·84
,,	Bawtry, Hesley Hall	2·21	XX.	Dunmanway, The Rectory ..	2·58
,,	Whaley Bridge, Mosley Hall	3·24	,,	Gap of Dunloe Gearahameen	3·40
,,	Derby, Midland Railway.....	3·25	,,	Mitchelstown Castle.....	2·24
VIII.	Nantwich, Dorfold Hall	2·41	,,	Darrynane Abbey.....	...
,,	Bolton, Queen's Park	3·02	,,	Clonmel, Bruce Villa	2·12
,,	Lancaster, Strathspey	2·19	,,	Broadford, Hurdlestown.....	2·69
IX.	Langsett Moor, Up. Midhope	2·73	XXI.	Enniscorthy, Ballyhyland...	2·81
,,	Scarborough, Scalby	2·51	,,	Rathnew, Clonmannon	2·40
,,	Ingleby Greenhow	2·14	,,	Ballycumber, Moorock Lodge	1·67
,,	Mickleton	1·70	,,	Balbriggan, Ardgillan	2·52
X.	Bellingham, High Green Manor	1·48	,,	Castle Forbes Gardens.....	1·72
,,	Ilderton, Lilburn Cottage ...	2·02	XXII.	Ballynahinch Castle.....	3·23
,,	Keswick, The Bank.....	1·82	,,	Woodlawn	2·22
XI.	Llanfrechfa Grange	—	,,	Westport, St. Helens	1·79
,,	Treherbert, Tyn-y-waun	2·65	,,	Dugort, Slievemore Hotel ...	1·80
,,	Carmarthen, The Friary	1·70	XXIII.	Enniskillen, Portora.....	1·99
,,	Fishguard, Goodwick Station.	1·49	,,	Dartrey [Cootehill]	2·09
,,	Crickhowell, Tal-y-maes.....	...	,,	Warrenpoint, Manor House ..	2·95
,,	New Radnor, Ednol	2·77	,,	Belfast, Cave Hill Road	3·08
,,	Birmingham WW., Tyrmynydd	3·73	,,	Glenarm Castle	3·12
,,	Lake Vyrnwy	4·08	,,	Londonderry, Creggan Res...	2·29
,,	Llangynhafal, Plas Drâw.....	3·58	,,	Milford, The Manse.....	2·04
,,	Rhwibryfdir	6·11	,,	Killybegs	2·47
,,	Dolgelly, Bryntirion.....	5·27			

Climatological Table for the British Empire, December, 1917.

STATIONS. (*Those in italics are South of the Equator.*)	Absolute. Maximum. Temp.	Date.	Absolute. Minimum. Temp.	Date.	Average. Max.	Min.	Dew Point.	Humidity.	Absolute. Max. in Sun.	Min. on Grass.	Total Rain. Depth.	Days.	Aver. Cloud.
	°		°		°	°	°	0-100	°	°	inches		
London, CamdenSquare	53·8	1	21·6	19	41·1	31·3	32·4	87	82·8	18·9	1·11	14	7·0
Malta	66·2	1	41·2	6	59·1	50·8	...	75	110·0	33·5	2·31	15	2·5
Lagos	89·0	var.	69·0	6	87·9	74·4	74·7	78	147·0	68·3	1·60	6	5·7
Cape Town	94·0	9	53·3	30	78·7	59·0	54·1	60	...	...	·46	3	2·5
Johannesburg	79·5	5	47·2	2	71·4	53·7	54·7	81	...	47·0	7·71	22	7·0
Mauritius	88·9	18	63·7	6	83·8	69·3	64·8	73	...	57·6	1·40	12	5·2
Bloemfontein	88·8	4	50·5	9	84·2	57·6	52·8	55	..	...	2·30	10	4·4
Calcutta...	80·1	10	50·7	24	76·4	55·9	55·0	70	...	43·9	·00	0	1·6
Bombay...	86·3	24	62·7	31	82·8	68·7	65·3	71	137·2	53·9	·00	0	0·5
Madras	86·9	31	63·7	30	82·6	69·0	67·8	78	156·9	59·4	6·06	7	4·9
Colombo, Ceylon ...	86·8	24	64·4	29	84·3	70·9	69·6	80	166·1	55·8	4·30	9	5·3
Hongkong	71·7	1	46·9	31	63·7	55·2	46·6	60	...	...	1·14	3	4·3
Sydney	100·0	23	58·2	11	77·3	63·5	59·8	64	153·0	51·9	1·76	14	5·3
Melbourne	101·0	22	48·7	14	78·1	57·9	52·8	57	153·7	41·4	2·89	6	5·1
Adelaide	104·0	22	47·5	9	85·3	61·5	52·6	44	159·4	39·2	1·02	4	4·1
Perth	95·3	31	51·2	4	77·5	59·3	56·7	66	158·2	44·0	1·96	7	4·5
Coolgardie	105·0	15	52·0	4, 11	86·6	59·8	50·6	42	173·0	45·0	1·02	6	3·2
Hobart, Tasmania ..	87·8	16	42·0	10	70·2	53·5	49·9	64	150·0	35·3	·89	13	6·4
Wellington	76·0	3	45·2	17*b*	67·9	54·4	51·7	71	148·0	34·5	2·86	16	5·8
Jamaica, Kingston ...	87·2	11	63·1	27	83·7	68·0	66·2	79	...	...	1·04	8	2·7
Grenada	86·0	13*a*	70·0	4*c*	88·0	72·0	...	77	138·0	...	7·08	20	5·0
Toronto	41·6	24	—17·0	29	26·7	12·4	13·2	82	78·2	—20·2	2·40	14	...
Fredericton	38·0	9	—25·0	30	21·3	—25·0	5 0	...	...	...	2·15	10	5·6
St. John, N.B. ...	46·5	9	—19·7	30	25·7	8·9	15·8	76	90·0	—20·0	3·04	15	6·2
Victoria, B.C.	56·4	31	27·5	24	45·4	37·3	39·0	90	93·0	22·5	13·02	27	8·8

a—20, 23. *b*—19. *c*—24, 26, 31.

Johannesburg.—Bright sunshine 179·8 hours.

COLOMBO, CEYLON.—Mean temp. 77°·6, or 1°·2 below, dew point 1°·4 below, and R ·01 in. above, averages. Mean hourly velocity of wind 4·6 miles.

HONGKONG.—Mean temp. 59°·2. Bright sunshine 209·0 hours. Mean hourly velocity of wind 11·6 miles.

Melbourne.—Temp. was over 90° for seven consecutive days, an absolute record for early heat in Victoria.

Adelaide.—Mean temp. 2°·3 above, and R ·06 in. above, averages.

Perth.—Rainfall 1·41 in. above average.

Coolgardie.—Temp. 2°·8 below, and R above, averages.

Hobart.—Temp. 1°·5 above, and R 1·10 in. below, averages.

Wellington.—Mean temp. 0°·8 above, and R ·43 in. below, averages. Bright sunshine, 217·4 hours; early part of the month bright and sunny, and latter part cloudy and showery.